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Cont

In addition, the polymer may contain from about 0 to 2 mole % of an internal cross-linker, such as ethylene glycol dimethacrylate (EGDMA), diallyl maleate (DAM), diallyl phthalate (DAP), divinyl benzene (DVB), and poly(ethylene glycol) di(meth)acrylate (PEGDMA). The internal cross-linker is preferably present in the amount of 0.1 to 1 mole % based on the polymer and most preferably 0.2 to 0.8 mole %. The polymer may also contain about 0 to 35 mole % of uncharged water soluble monomer or macromer. Examples of suitable uncharged monomers or macromers are dialkylaminoethyl methacrylate, hydroxy alkyl (meth)acrylate, hydroxy alkyl vinyl ether, poly(ethylene glycol) (meth)acrylate, polyethylene glycol, glycerol, diethylenetriamine, polyethyleneimine, and combinations of these compounds.

REMARKS

Favorable reconsideration of this application, as amended, and in light of the following discussion is respectfully requested.

Claims 1-66 are pending in this application. Claims 1-25 and 66 have been amended. These amendments introduce no new matter into the application. The specification has been amended at page 13. No new matter is introduced by this Amendment. Claims 3, 4, 13-15, 19-21, and 26-65 stand withdrawn from consideration. Claims 1, 2, 5-12, 16-18, 22-25, and 66 are elected as the basis for this Response.

Objections to the Specification

The Examiner objected to the disclosure based upon the data missing at lines 5-7 on page 13. The foregoing amendment to the specification inserts the illustrative reaction discussed in the proceeding sections of the disclosure. Support exists for this

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illustrative reaction throughout the specification. Specifically, pages 12-13 of the specification describe both alkyl acrylates and MAPTAC as two components of the polymerization reaction. Furthermore, Examples 3-6 describe the copolymerization of butyl acrylate and MAPTAC. (Specification at page 19, lines 4-10). That example recites a description of the use of AIBN as an initiator in the polymerization process. The illustrative reaction therefore contains no new matter. In view of this amendment, withdrawal of this objection is respectfully requested.

Objections to Claims

Claims 17 and 66 have been objected to based upon minor informalities. In view of the amendment of these claims, as requested by the Examiner, withdrawal of this objection is respectfully requested.

35 U.S.C. § 112

The Examiner has rejected claims 1-2, 5-12, 16-18, 22-25, and 66 as non-enabled under 35 U.S.C. § 112, ¶ 1. Specifically, the Examiner stated that the specification "does not reasonably provide enablement for polymers formed from a backbone polymer and a cationic monomer." Moreover, the Examiner states that the claims as written "would presumably be graft copolymers" and that "[n]owhere does the specification teach how to make polymers such as are being claimed." This rejection is respectfully traversed.

First, contrary to the position of the Examiner, the claims do not limit the structure to a graft copolymer. The claims are interpreted and read in light of the specification. In

this regard, the Examiner's attention is directed to the specification at, for example, pages 7-8, 12, and 15-16. While the claims may include graft copolymers, they are in no way limited to such copolymers. In fact, claim 5 reads "wherein the polymer comprises a cationically charged monomer and a backbone co-polymerizable with the cationically charged monomer." (Emphasis added).

The specification states in the sentence bridging pages 7-8 "[t]he polymer comprises a cationically charged monomer and a backbone co-polymerizable with the cationically charged monomer." Furthermore, the Examiner noted in paragraph 9 of the pending Official Action that "[t]he only polymers specifically disclosed are those . . . wherein both monomers result in forming the polymer backbone." (Emphasis added). The specification describes further this newly formed copolymer backbone on page 12: "The cationically charged polymer contains one or more backbone compounds co-polymerized with one or more cationically charged monomers."

The Examiner's attention is further directed to the specification, as amended, which amendment illustrates the previously described reaction of a polymer comprising "a cationically charged monomer and a backbone co-polymerizable with the cationically charged monomer." The present invention, evidenced by the description on pages 15-16 of the specification yields a new polymer backbone:

The concentrations of the cationically charged monomer and the backbone added to the reaction mixture are chosen based on the desired repulping cationic content of the coating or composition. The reaction mixture may be polymerized by heating it to a temperature sufficient to initiate polymerization of the mixture for the period of time required to complete the reaction in the presence or absence of an initiator.

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Thus, one skilled in the art would not read the specification as directed merely to graft copolymers, but instead would understand, i.e, know how to make and use, the disclosed copolymerization of monomers of the types disclosed. Withdrawal of this rejection under 35 U.S.C. § 112, ¶ 1, is respectfully requested.

The Examiner also rejected claims 10-12, 16-18, and 66 as indefinite under 35 U.S.C. § 112, ¶ 2, for failing to particularly point out and distinctly claim the subject matter regarded as the invention. Specifically, the Examiner rejected claim 10 as indefinite because the claim recites monomers that alone are not polymers and states that "the alkyl group" lacks antecedent basis.

The term "backbone," as used in the specification as well as in the claims, does not refer solely to a polymer backbone to which cationic monomer units attach. The specification, in the paragraph that bridges pages 15-16, states "[t]he reaction mixture may be polymerized by heating it to a temperature sufficient to initiate polymerization. . . ." Likewise, the Examples, including the illustrative reaction equation amended at page 13 of the specification, exemplify that the polymer claimed in the present invention, co-polymerizes with both the "backbone" units and the cationic monomer units.

As for whether "there is any teaching of combinations of backbone polymers or backbone polymers with the monomers included in the group," the specification teaches in Examples 1-2 and 3-6 the making of such polymers.

As for the Examiner's rejection of claim 12 because "[v]inyl benzyl trimethyl ammonium chloride (sic) is indefinite because it is unclear where the benzyl and vinyl groups belong," the location of either the vinyl group or the benzyl group can be any

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location known to the skilled artisan. In light of the foregoing amendments, Applicants respectfully request withdrawal of the Examiner's rejection of claims 11-12 under 35 U.S.C. § 112.

The Examiner also rejected claim 18 as indefinite "because it further comprises a monomer or macromer the amount could not be 0 mole %." As that claim stands amended, the Examiner's rejection of claim 18 is overcome.

In light of the foregoing amendments and remarks, Applicant respectfully requests the withdrawal of all of the outstanding rejections under 35 U.S.C. § 112.

35 U.S.C. § 102/103:

The Examiner rejected all of the elected claims for a lack of novelty, or in the alternative, for obviousness. The Examiner cited each of the Mandeville, Bister, and Huth references for the above mentioned reasons. These rejections are respectfully traversed.

None of the cited references teach or suggest an adhesive composition of cationic hydrophobic copolymers. Mandeville teaches a cationic copolymer for use as a toxin binding agent. The copolymer is used to inhibit toxins in mammals, such as humans. These copolymers are precipitated from the reaction mixture, purified from the mixture and then redissolved in water solutions so that they may be used as toxin binding agents. Mandeville fails to teach or suggest cationic copolymers for recyclable adhesives or adhesive paper coatings.

Likewise, Bister fails to teach or suggest an adhesive composition of cationic, hydrophobic copolymers. The cationic polymers of Bister are water insoluble. These

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copolymers are dispersed and then used for priming or impregnating an absorbent substrate. The copolymers of Bister do not form an adhesive. Thus, Bister neither teaches nor suggests the invention as presently claimed.

Finally, Huth disclose cationic polymer dispersions that are water insoluble and used as internal paper sizing agents. They are added to the web during formation of the paper. These materials are clearly not adhesive.

As amended, Claim 1 clearly states that an adhesive or "adhesive" coating is being claimed. Since none of the cited references teaches or suggests an adhesive or adhesive coating, withdrawal of this rejection is respectfully requested.

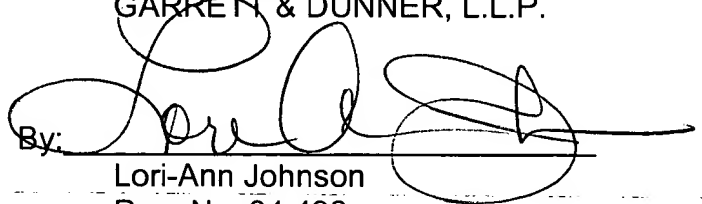
Conclusion

In view of the foregoing amendments and remarks, Applicants respectfully request the reconsideration and the continued examination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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Dated: December 27, 2002

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**APPENDIX TO AMENDMENT OF DECEMBER 27, 2002
Version with Markings to Show Changes Made**

Amendments to the Claims

1. A recyclable adhesive or adhesive coating comprising a polymer which is soluble or dispersible in water, wherein the polymer has 5 to 40 mol % of cationic repeat units, and wherein the adhesive or coating is attracted to fibers during paper recycling.

2. The recyclable adhesive or adhesive coating of claim 1, wherein the adhesive is substantially tacky such that it forms a pressure-sensitive adhesive which is capable of bonding to a surface upon contact.

3. The recyclable adhesive or adhesive coating of claim 1, wherein the adhesive is a hot-melt adhesive capable of bonding to a surface when heated to above its melting point temperature.

4. The recyclable adhesive or adhesive coating of claim 3, wherein the hot melt adhesive is formed by reacting polyamide with epichlorohydrin.

5. The recyclable adhesive or adhesive coating of claim 1, wherein the polymer comprises a cationically charged monomer and a backbone co-polymerizable with the cationically charged monomer.

6. The recyclable adhesive or adhesive coating of claim 5, wherein the backbone is present in the amount of 60 to 95 mole % based on the polymer.

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7. The recyclable adhesive or adhesive coating of claim 5, wherein the backbone is present in the amount of 80 to 90 mole % based on the polymer.

8. The recyclable adhesive or adhesive coating of claim 5, wherein the cationically charged monomer is present in the amount of 5 to 40 mole % based on the polymer.

9. The recyclable adhesive or adhesive coating of claim 5, wherein the cationically charged monomer is present in the amount of 8 to 25 mole % based on the polymer.

10. (Amended) The recyclable adhesive or adhesive coating of claim 5, wherein the backbone [is selected from the group consisting of] comprises vinyl acetate, butadiene, styrene, acrylate comprising 1 to 8 carbon atoms in the acrylate's alkyl group, polyacrylate comprising 1 to 8 carbon atoms in the polyacrylate's alkyl group, polyester, polyamide, and combinations thereof.

11. (Amended) The recyclable adhesive or adhesive coating of claim 5, wherein the cationically charged monomer is an alkyl ammonium halide [chloride].

12. (Amended) The recyclable adhesive or adhesive coating of claim 5, wherein the cationically charged monomer is selected from the group consisting of 3-(methacryloylamino)propyltrimethylammonium chloride [{3-(methacryloylammino)-propyl}-trimethyl ammonium chloride], 2-(methacryloyloxy)ethyltriethyl ammonium chloride [{2-(methacryloyloxy)ethyl}-trimethyl ammonium chloride], diallyldimethylammonium chloride, and vinyl benzyl trimethyl ammonium chloride.

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13. The recyclable adhesive or adhesive coating of claim 5, wherein the polymer further comprises an internal cross-linker present in the amount of up to 2 mole %, based on the polymer.

14. The recyclable adhesive or adhesive coating of claim 5, wherein the polymer further comprises an internal cross-linker present in the amount of 0.1 to 1 mole %, based on the polymer.

15. The recyclable adhesive or adhesive coating of claim 13, wherein the internal cross-linker is chosen from at least one of [selected from the group consisting of] ethylene glycol dimethylether, diallyl maleate, diallyl phthalate, divinyl benzene, and poly(ethylene glycol) di(meth)acrylate.

16. The recyclable adhesive or adhesive coating of claim 10, wherein the acrylate in an alkyl (meth)acrylate.

17. (Amended) The recyclable adhesive coating of claim 16, wherein the alkyl (meth)acrylate [alkyl(meth)acrylate] is selected from n-butyl acrylate, 2-ethylhexyl [2-ethyl hexyl] acrylate, and isooctyl acrylate.

18. (Amended) The recyclable adhesive or adhesive coating of claim 5, wherein the polymer further comprises up to [0 to] 35 mole % based on the polymer of an uncharged water soluble monomer or macromer.

19. The recyclable adhesive or adhesive coating of claim 18, wherein the uncharged water soluble monomer or macromer is [selected from the group consisting of,] chosen from at least one of dialkylaminoethyl methacrylate, hydroxy alkyl (meth)acrylate, hydroxy alkyl vinyl ether, poly(ethylene glycol) (meth)acrylate,

polyethylene glycol, glycerol, diethylenetriamine, and polyethyleneimine[, and combinations of these compounds].

20. The recyclable adhesive or adhesive coating of claim 5, wherein the adhesive further comprises a plasticizer to increase the flexibility of the adhesive.

21. The recyclable adhesive or adhesive coating of claim 5, wherein the adhesive further comprises a tackifier to render the adhesive tacky.

22. The recyclable adhesive or adhesive coating of claim 1, wherein the adhesive or adhesive coating forms a tape.

23. The recyclable adhesive or adhesive coating of claim 1, wherein the adhesive or adhesive coating forms a label.

24. The recyclable adhesive or adhesive coating of claim 1, wherein the adhesive or adhesive coating forms a paper coating.

25. The recyclable adhesive or adhesive coating of claim 1, wherein the adhesive or adhesive coating forms a self-adhesive stamp.

66. A recyclable adhesive paper coating made according to the method comprising:

combining a cationically charged monomer and a backbone which is copolymerizable with the cationically charged monomer to form a reaction mixture, wherein the concentrations of the cationically charged monomer and the backbone are pre-selected to control the cationic content of the adhesive;

polymerizing the reaction mixture to form a coating comprising a polymer which is soluble or dispersible in water, wherein the polymer has 5 to 40 % of cationic repeat units such that the coating is attracted to fibers during recycling; and

wherein the recyclable coating is for a recyclable paper coating [of claim 26].

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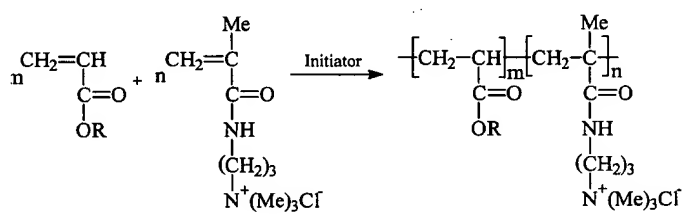
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APPENDIX TO AMENDMENT OF DECEMBER 27, 2002
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Amendments to the Specification

On pages 12 and 13 of the specification, the paragraph bridging from pages 12 and 13 should be as follows:

The cationically charged monomer is present in the polymer in an amount of about 5 to 40 mole %, preferably 8 to 25 mole % and most preferably 10-20 mole %. Alkyl ammonium chlorides, such as {3-(methacryloylammino) propyl} trimethyl-ammonium chloride (MAETAC, diallyldimethyl-ammonium chloride (DADMAC), and vinyl-benzyl trimethyl-ammonium chloride (VBC), may serve as the cationically charged unit. The following reaction illustrates one example of the preparation of a cationically charged PSA:



In addition, the polymer may contain from about 0 to 2 mole % of an internal cross-linker, such as ethylene glycol dimethylate (EGD[,])₂, diallyl maleate (DAM), diallyl phthalate (DAP), divinyl benzene (DVB), and poly(ethylene glycol) di(meth)-acrylate (PEGDMA). The internal cross-linker is preferably present in the amount of 0.1 to 1 mole % based on the polymer and most preferably 0.2 to 0.8 mole %. The polymer may

also contain about 0 to 35 mole % of uncharged water soluble monomer or macromer.

Examples of suitable uncharged monomers or macromers are dialkylaminoethyl methacrylate, hydroxy alkyl (meth) acrylate, hydroxy alkyl vinyl ether, poly (ethylene glycol) (meth)acrylate, polyethylene glycol, glycerol, diethylenetriamine, polyethyleneimine, and combinations of these compounds.

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